

DO NOT OPEN THIS TEST BOOKLET TILL YOU ARE ASKED TO DO SO

TR/DLTI/ELECT/P-II/17

Test Booklet Series

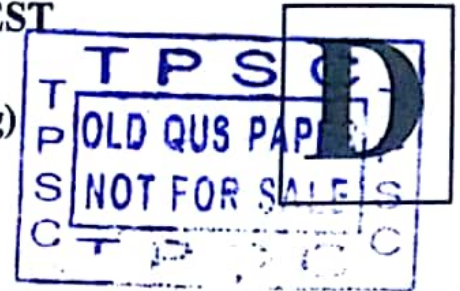
**TEST BOOKLET
GENERAL ABILITY TEST**

(PART- II)

(Electrical Engineering)

(Signature of the Candidate)

(Invigilator's Signature)



Time Allowed : 1 hour 30 minutes (One hour thirty minutes)

Maximum Marks : 60

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE SCREENING TEST, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. **ENCODE CLEARLY THE TEST BOOKLET SERIES IN THE APPROPRIATE PLACE IN THE ANSWER SHEET BY BLACK BALL POINT PEN ONLY.**
3. This Test Booklet contains 60 items (questions). Each question, carrying 1 (one) mark only, has four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the most appropriate. In any case, choose **ONLY ONE** response for each item.
4. You have to mark all your responses by **Black Ball Point Pen only** on the separate Answer Sheet provided. See directions in the Answer Sheet.
5. All items carry equal marks.
6. Before you proceed to mark in the Answer Sheet the responses to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet.
7. After you have completed filling in responses on the Answer Sheet and the Screening Test is completed, you should handover the Answer Sheet to the Invigilator only. You are permitted to take the Test Booklet with you.
8. Sheets for rough work are appended on the Test Booklet at the end.
9. **Penalty for wrong answers :**
 - (a) There will be four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **one-third** of the marks assigned to that question will be deducted as penalty.
 - (b) If a candidate gives more than one answer, it will be treated as a **Wrong Answer** even if one of the given answers happens to be correct and there will be same penalty as above to that question.
 - (c) If a question is left blank, i.e. no answer is given by the candidate, there will be **no penalty** for that question.

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Four options are given against each of the following questions. Select the best/correct option from among the four options and encode in the answer sheet by using **Black Ball Point Pen** only as per example given below :

Example : The unit of power is

(A) Joule

(B) Calorie

(C) Watt

☒ Watt/second

Symbols have their conventional meaning

1. Electrical appliances are connected in parallel because it
 - (A) it is a simple circuit
 - (B) draws less current
 - (C) results in reduced power loss
 - (D) makes the operation of appliances independent of each other
2. A strain gauge has a
 - (A) piezoelectric effect
 - (B) piezoresistive effect
 - (C) piezocapacitive effect
 - (D) piezoinductive effect
3. Various power system faults in increasing orders of severity are as below :
 - (A) LG, LL, LLG, LLLG
 - (B) LLLG, LLG, LG, LL
 - (C) LLG, LLLG, LL, LG
 - (D) LL, LG, LLLG, LLG
4. Under the conditions of maximum power transfer, a voltage source is delivering a power of 30W to the load. The power generated by the source is
 - (A) 45W
 - (B) 30W
 - (C) 60W
 - (D) 90W

5. In a circuit breaker the time duration from the instant of the fault to the extinction of arc is known as
 - (A) operation time
 - (B) total clearing time
 - (C) lag time
 - (D) lead time
6. The stack pointer in the 8085 micro-processor is a
 - (A) 16 bit register which points to stack memory locations
 - (B) 16 bit accumulator
 - (C) memory location in the stack
 - (D) flag register used for the stack
7. Dielectric constant for vacuum is
 - (A) infinity
 - (B) 100
 - (C) 1
 - (D) zero
8. Magnetic field inside a current carrying solenoid is
 - (A) directly proportional to current
 - (B) directly proportional to its length
 - (C) inversely proportional to number of turns
 - (D) inversely proportional to current
9. If one cycle of a.c waveform occurs every milliseconds, the frequency will be
 - (A) 1/1000 Hz
 - (B) 50 Hz
 - (C) 100 Hz
 - (D) 1000 Hz
10. Kirchhoff's voltage law deals with
 - (A) Conservation of energy
 - (B) Conservation of charge
 - (C) Conservation of momentum
 - (D) Conservation of angular momentum
11. Which of the following instrument will be suitable for the measurement of temperature of a furnace?
 - (A) clinical thermometer
 - (B) mercury thermometer
 - (C) optical pyrometer
 - (D) bimetallic thermometer
12. A pointer of an instrument on deflected returns to zero position when the current is removed, due to
 - (A) action of gravity
 - (B) mass of the pointer
 - (C) controlling torque
 - (D) damping torque

13. Presence of nonlinearities in a control system tends to introduce
- (A) transient error
 - (B) instability
 - (C) steady state error
 - (D) all of these
14. A magnetic needle is kept in a uniform magnetic field. It experiences
- (A) a force and a torque
 - (B) a force but not a torque
 - (C) a torque but not a force
 - (D) neither a torque nor a force
15. When a ferromagnetic substance is magnetised, small changes in dimensions occur which is known as
- (A) magnetic hysteresis
 - (B) magnetic expansion
 - (C) magnetostriction
 - (D) magneto-calorisation
16. What output voltage would be produced by a D/A converter whose output range is 0 to 10V and whose input binary number is 10
- (A) 5V
 - (B) 10V
 - (C) 15V
 - (D) 20V
17. Nichols chart is useful in determining
- (A) closed loop frequency response
 - (B) open loop frequency response
 - (C) open loop and closed loop frequency response
 - (D) none of these
18. The running speed of a three phase induction motor is
- (A) synchronous speed
 - (B) $0.95 \times$ synchronous speed
 - (C) synchronous speed $\times (1 - \text{slip})$
 - (D) synchronous speed \times slip
19. The armature reaction in a d.c generator can be increased by increasing the
- (A) field current
 - (B) armature current
 - (C) both field current and armature current
 - (D) none of the above
20. In synchronous motor out of the following losses, which one will have the highest proportion ?
- (A) stator copper losses
 - (B) friction and windage losses
 - (C) eddy current losses
 - (D) iron losses



21. In force-voltage analogy, moment of inertia is analogous to

- (A) capacitance
- (B) inverse capacitance
- (C) inductance
- (D) inverse inductance

22. In pumped storage

- (A) power is produced by means of pump
- (B) water is stored by pumping to high pressure
- (C) downstream water is pumped upstream during off load periods
- (D) water is recirculated through turbine

23. The open-circuit test on a transformer is always made on

- (A) low-voltage winding
- (B) high-voltage winding
- (C) either low or high voltage winding
- (D) none of the above

24. A control rod in a nuclear power reactor is used to

- (A) initiate the nuclear chain reaction
- (B) maintain the chain reaction at a steady value during operation
- (C) shuts down the reactor automatically under emergency conditions
- (D) all of the above

25. Signal flow graph is a

- (A) semilog graph
- (B) loglog graph
- (C) topological representation of a set of differential equations
- (D) a special type of graph for analysis of modern control system

26. As we add shunt capacitors to a transmission line, its stability

- (A) decreases
- (B) increases
- (C) remains unchanged
- (D) may increase or decrease

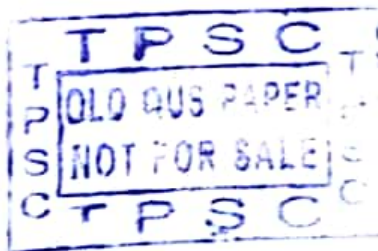
27. If a system has some poles lying on the imaginary axis, it is

- (A) unconditionally stable
- (B) conditionally stable
- (C) marginally stable
- (D) unstable

28. Resistivity is a property of a semiconductor that depends on

- (A) the shape of the semiconductor
- (B) the atomic nature of the semiconductor
- (C) the shape and atomic nature of the semiconductor
- (D) the length of the semiconductor

29. A field effect transistor (FET)
- (A) uses a high-concentration emitter junction
 - (B) uses a forward-biased P-N junction
 - (C) has a very high input resistance
 - (D) depends on minority-carrier flow
30. The hysteresis loop of a material having low retentivity is
- (A) wide
 - (B) narrow
 - (C) very wide
 - (D) none of the above
31. The overall gain of a two-stage RC-coupled amplifier is 100. A signal voltage of 10V, 1 kHz is applied across the output terminals of this amplifier. Then, the voltage obtained across the input terminals will be
- (A) 0.1V, 1 kHz
 - (B) 0V
 - (C) 100V, 1 kHz
 - (D) 10V, 1 kHz
32. The minimum duration of pulse in a pulse triggering system for thyristors should be at least
- (A) 10 μ s
 - (B) 10 ms
 - (C) 30 ms
 - (D) 1 s
33. Maxwell bridge is used to measure
- (A) resistance
 - (B) inductance
 - (C) capacitance
 - (D) frequency
34. When a P-N junction is biased in the forward direction
- (A) only holes in the P region are injected into the N region
 - (B) only electrons in the N region are injected into the P region
 - (C) majority carriers in each region are injected into the other region
 - (D) no carriers move
35. A material with unequal anti-parallel atomic magnetic moments is
- (A) an anti-ferromagnet
 - (B) ferrimagnet
 - (C) a ferrite
 - (D) non-magnetic
36. When two 2-port networks are connected in parallel, it is convenient to use
- (A) z parameters
 - (B) y parameters
 - (C) h parameters
 - (D) inverse h parameters



37. Which of the following modulation system is digital ?
- PPM
 - PCM
 - PWM
 - PFM
38. RC snubber circuit is used to limit the rate of
- rise of current in SCR
 - rise of voltage across SCR
 - conduction period
 - all of the above
39. In frequency modulation
- noise decreases by increasing frequency deviation
 - noise decreases by decreasing frequency deviation
 - noise is unaffected by change of frequency deviation
 - noise decreases by increasing the bandwidth
40. Kirchoff laws fail in the case of
- linear networks
 - nonlinear networks
 - dual networks
 - distributed parameter networks
41. In a step up chopper circuit, if V_s is the source voltage and α is duty cycle, then the output voltage is
- $V_s / (1 + \alpha)$
 - $V_s (1 + \alpha)$
 - $V_s (1 - \alpha)$
 - $V_s / (1 - \alpha)$
42. Current versus time graph for an ideal commutation is a
- straight line
 - parabola
 - hyperbola
 - none of the above
43. Which is the leading state in India in the generation of wind power ?
- Gujrat
 - Andhra Pradesh
 - Maharashtra
 - Tamil Nadu
44. The state that has maximum installation of small hydropower units in terms of megawatt is
- Karnataka
 - Tamil Nadu
 - Uttarakhand
 - Sikkim

45. Which country was the first to use geothermal energy to generate power ?
 (A) Italy
 (B) China
 (C) USA
 (D) UK
46. The voltage regulation of alternator depends on
 (A) load current only
 (B) p.f. only
 (C) both load current and p.f
 (D) none of the above
47. The e.m.f of a cell does not depend upon
 (A) nature of electrolyte
 (B) nature of material of electrodes
 (C) concentration of electrolyte
 (D) size and spacing of electrodes
48. Electrical energy can be produced from
 (A) Mechanical energy
 (B) Chemical energy
 (C) Radiant energy
 (D) All of the above
49. Power output from a wind electric generator is directly proportional to
 (A) wind velocity
 (B) square of wind velocity
 (C) cube of wind velocity
 (D) square root of wind velocity
50. Major source of power production in India is
 (A) Coal
 (B) Hydropower
 (C) Nuclear energy
 (D) Natural gas
51. The advantage of DC system over AC system is
 (A) improved line regulation
 (B) no skin effect
 (C) no charging currents
 (D) all of those
52. When sunlight falls onto a PV panel, some particles gain enough energy to produce an electric current. These particles are called
 (A) Electrons
 (B) Protons
 (C) Neutrons
 (D) None of the above

53. The output of fuel cell is
- (A) High-voltage AC power
 - (B) High-voltage DC power
 - (C) Low-voltage AC power
 - (D) Low-voltage DC power
54. Energy efficiency of a system can be improved by
- (A) using technically advanced equipment
 - (B) good consumer behaviour
 - (C) increasing the energy input
 - (D) decreasing the energy output
55. The unit of resistivity is
- (A) Ohm
 - (B) Ohm per meter
 - (C) Ohm meter
 - (D) mho
56. The response of a network is of the form ke^{st} , where $s = \sigma + j\omega$. Then ω is known as
- (A) radian frequency
 - (B) neper frequency
 - (C) complex frequency
 - (D) frequency in Hertz
57. The percentage of energy saved at the current rate of use, compared to the rate of use of the reference year, is called
- (A) energy utilization
 - (B) energy performance
 - (C) energy efficiency
 - (D) none of the above
58. Emitter follower is a negative feedback amplifier using
- (A) voltage series feedback
 - (B) current series feedback
 - (C) current shunt feedback
 - (D) voltage shunt feedback
59. In a transformer, the resistance between its primary and secondary should be
- (A) zero
 - (B) infinite
 - (C) about $1 \text{ M}\Omega$
 - (D) about $100 \text{ M}\Omega$
60. If a single phase motor runs slow, it may be due to
- (A) overload
 - (B) low frequency
 - (C) low voltage
 - (D) any of the above

(Space for rough work)

